

Figure No.	Reference Numeral	Description	Abbreviation
Fig. 1	100	Polarization Compensation System	
	101	Transmitter	
	102	Fiber	
	103	Polarization Controller	PC
	104	Adjustable Birefringent Element	ABE
	105	Tap	
	106	Monitor	
	107	Processor with Control Algorithm	
Fig. 2	108	Receiver	
	110	CD and PMD Compensation System	
	101	Transmitter	
	102	Fiber	
	103	Polarization Controller	PC
	105	Tap	
	108	Receiver	
	109	CD and PMD Compensator	AODC
Fig. 3	110	CD and PMD Monitor	
	111	Processor with Control Algorithm	
	121	Overlay of Group Delay and Transmittance	
Fig. 4	122	Group Delay	GD
		Transmittance	T
	131	Saw Tooth Filter for 10Gbps RZ Format	
	132	Group Delay	GD
	133	Transmittance	T
Fig. 5	134	Ideal Linearized Group Delay	IGD
		Compensated Band Width	CBW
		Preferred Embodiment No. 1	AODC
	141	Input	
	142	Polarization Controller	PC
	143a	Polarization Beamsplitter	PBS1
	143b	Polarization Beamsplitter	PBS2
	144a	Waveplate Retarder	WR1
	144b	Waveplate Retarder	WR2
	144c	Waveplate Retarder	WR3
	144d	Waveplate Retarder	WR4
	145a	Multi-Cavity Gire-Tournois Resonator	R1
	145b	Multi-Cavity Gire-Tournois Resonator	R2
	145c	Multi-Cavity Gire-Tournois Resonator	R3
	145d	Multi-Cavity Gire-Tournois Resonator	R4
Fig. 6a	146	Output	
	150a	Group Delay for Resonator 1	
	151a	Optical Signal	
Fig. 6b	label	Group Delay (ps)	GD
	label	Lambda (nm)	
	150b	Group Delay for Resonator 2	
Fig. 6c	151b	Optical Signal	
	label	Group Delay (ps)	GD
	label	Lambda (nm)	
Fig. 6c	150c	Group Delay for Resonator 3	
	151c	Optical Signal	
	label	Group Delay (ps)	GD
	label	Lambda (nm)	

Fig. 6d	150d	Group Delay for Resonator 4	
	151d	Optical Signal	
	label	Group Delay (ps)	GD
	label	Lambda (nm)	
Fig. 7a	160	Group Delay of Resonator Pairs	
	161	Optical Signal	
	162	Group Delay from R1 and R2	
	163	Group Delay from R3 and R4	
	label	Group Delay (ps)	GD
	label	Lambda (nm)	
Fig. 7b	170	Combined Group Delay of Resonator Pairs	
	171	Optical Signal	
	172	Group Delay from (R1+R2) and (R3+R4)	
	label	Group Delay (ps)	GD
	label	Lambda (nm)	
Fig. 8a	180a	Group Delay for Resonator 1	
	181a	Optical Signal	
	182a	Slow Axis From R1	
	label	Group Delay (ps)	GD
	label	Lambda (nm)	
Fig. 8b	180b	Group Delay for Resonator 2	
	181b	Optical Signal	
	182b	Fast Axis From R2	
	label	Group Delay (ps)	GD
	label	Lambda (nm)	
Fig. 8c	180c	Group Delay for Resonator 3	
	181c	Optical Signal	
	182c	Slow Axis From R3	
	label	Group Delay (ps)	GD
	label	Lambda (nm)	
Fig. 8d	180d	Group Delay for Resonator 4	
	181d	Optical Signal	
	182d	Fast Axis From R4	
	label	Group Delay (ps)	GD
	label	Lambda (nm)	
Fig. 9a	190	Combined Group Delay of Resonators	
	191	Optical Signal	
	192a	Slow Axis R1	
	192b	Fast Axis R2	
	192c	Slow Axis R3	
	192d	Fast Axis R4	
	label	Group Delay (ps)	GD
	label	Lambda (nm)	
Fig. 9b	200	Combined GD and DGD of Resonator Pairs	
	201	Optical Signal	
	202	Group Delay from R1& R2	
	203	Group Delay from R3 & R4	
	label	Differential Group Delay	DGD
	label	Group Delay (ps)	GD
	label	Lambda (nm)	

Fig. 10	210	First Alternate AODC Embodiment without Waveplates	
	211	Input	
	212	Polarization Controller	PC
	213a	Multi-Cavity Gire-Tournois Resonator	R1
	213b	Multi-Cavity Gire-Tournois Resonator	R2
	213c	Multi-Cavity Gire-Tournois Resonator	R3
	213d	Multi-Cavity Gire-Tournois Resonator	R4
	214a	Polarization Beamsplitter	PBS1
	214b	Polarization Beamsplitter	PBS2
	215a	Collimator	C1
	215b	Collimator	C2
	215c	Collimator	C3
	216	Fiber	
	217	Output	
Fig. 11	220	Second Alternate AODC Embodiment without Waveplates	
	221	Input	
	222	Polarization Controller	PC
	223	Multi-Port Circulator	
	224a	Polarization Beamsplitter	PBS1
	224b	Polarization Beamsplitter	PBS1
	225a	Multi-Cavity Gire-Tournois Resonator	R1
	225b	Multi-Cavity Gire-Tournois Resonator	R2
	225c	Multi-Cavity Gire-Tournois Resonator	R3
	225d	Multi-Cavity Gire-Tournois Resonator	R4
	226	Output	
Fig. 12	230	Alternate AODC Embodiment Employing Birefringent Beam Displacers	
	231	Input	
	232	Polarization Controller	PC
	233a	Beam Displacer	BD1
	233b	Beam Displacer	BD2
	234a	Multi-Cavity Gire-Tournois Resonator	R1
	234b	Multi-Cavity Gire-Tournois Resonator	R2
	234c	Multi-Cavity Gire-Tournois Resonator	R3
	234d	Multi-Cavity Gire-Tournois Resonator	R4
	235a	Waveplate Retarder	WR1
	235b	Waveplate Retarder	WR2
	235c	Waveplate Retarder	WR3
	235d	Waveplate Retarder	WR4
	236	Output	
Fig. 13	240	Alternate AODC Embodiment for Serial CD and PMD Compensation	
	241	Input	
	242	Multi-Port Circulator	
	243	Polarization Controller	PC
	244	Polarization Beamsplitter	PBS1
	245a	Multi-Cavity Gire-Tournois Resonator	R1
	245b	Multi-Cavity Gire-Tournois Resonator	R2
	245c	Multi-Cavity Gire-Tournois Resonator	R3
	245d	Multi-Cavity Gire-Tournois Resonator	R4
	246	Output	
	247	PMD Compensation Section	
	248	CD Compensation Section	

Fig. 14	250	Alternate AODC Embodiment Utilizing Ring Resonators	
	251	Input	
	252	Polarization Controller	PC
	253	Polarization Beamsplitter	PBS1
	254	Cascaded Ring Resonators - southern arm	
	255	Cascaded Ring Resonators - northern arm	
	256	Phase Shifters	
	257	Polarization Combiner	PBS2
	258	Output	
Fig. 15	260	Alternate AODC Embodiment Using FIR Filters	
	261	Input	
	262	Polarization Controller	
	263a	Polarization Beamsplitter	PBS1
	263b	Polarization Beamsplitter	PBS2
	264a	FIR Filter	FIR1
	264b	FIR Filter	FIR2
	265a	45 Degree Mirror	45DM1
	265b	45 Degree Mirror	45DM2
	266	Output	
Fig. 16	270	First Alternate AODC Embodiment Using Linearly Chirped FBG	
	271	Input	
	272	Polarization Controller	PC
	273	Polarization Beamsplitter	PBS1
	274a	Waveplate Retarder	WR1
	274b	Waveplate Retarder	WR2
	275a	Linearly Chirped Fiber Bragg Grating	LCFBG1
	275b	Linearly Chirped Fiber Bragg Grating	LCFBG2
	276	Output	
Fig. 17	280	Second Alternate AODC Embodiment Using Linearly Chirped FBG	
	281	Input	
	282	Polarization Controller	
	283	Beam Displacer	
	284a	Waveplate Retarder	WR1
	284b	Waveplate Retarder	WR2
	285a	Linearly Chirped Fiber Bragg Grating	LCFBG1
	285b	Linearly Chirped Fiber Bragg Grating	LCFBG2
	286	Output	

Fig. 18	290	Alternate AODC Embodiment Employing Non-linearly Chirped FBG	
	291	Input	
	292	Polarization Controller	PC
	293a	Polarization Beamsplitter	PBS1
	293b	Polarization Beamsplitter	PBS2
	294a	Waveplate Retarder	WR1
	294b	Waveplate Retarder	WR2
	294c	Waveplate Retarder	WR3
	294d	Waveplate Retarder	WR4
	295a	Non-linearly Chirped Fiber Bragg Grating	NLCFBG1
	295b	Non-linearly Chirped Fiber Bragg Grating	NLCFBG2
	295c	Non-linearly Chirped Fiber Bragg Grating	NLCFBG3
	295d	Non-linearly Chirped Fiber Bragg Grating	NLCFBG4
	296	Ouput	
Fig. 19	300	Balanced Fabry-Perot Filter For Use in an AODC	
	301	Input	
	302	Transmitted Light	
	303	Combiner	
	304	Reflected Light	
	305	Output	
Fig. 20	310	Spatially Variable Coating Etalon for Use in an AODC	
	311a	Discrete Reflectance Region	DRR1
	311b	Discrete Reflectance Region	DRR2
	311c	Discrete Reflectance Region	DRR3
	311d	Discrete Reflectance Region	DRR4
	311e	Discrete Reflectance Region	DRR5
	311f	Discrete Reflectance Region	DRR6

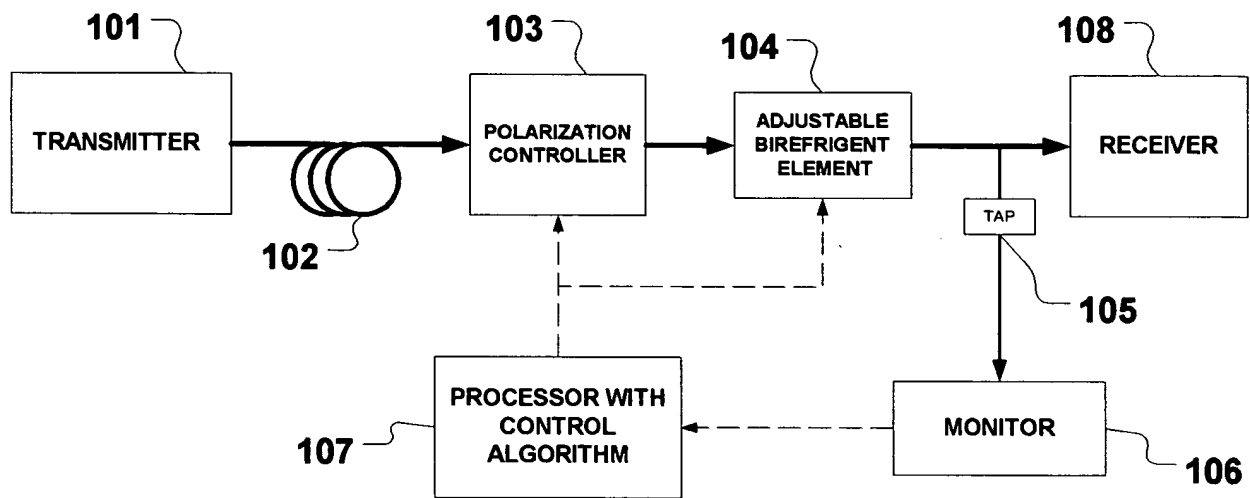


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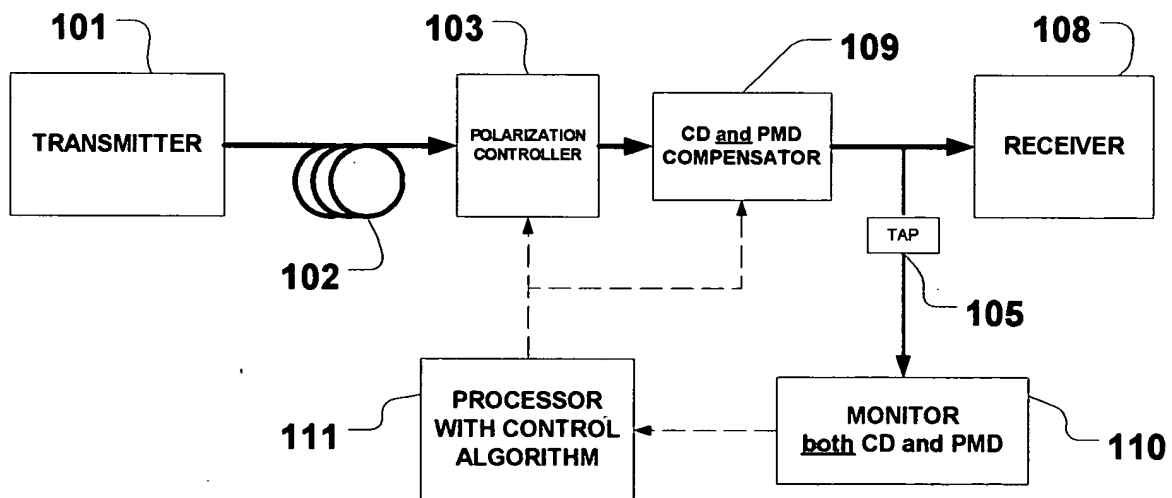


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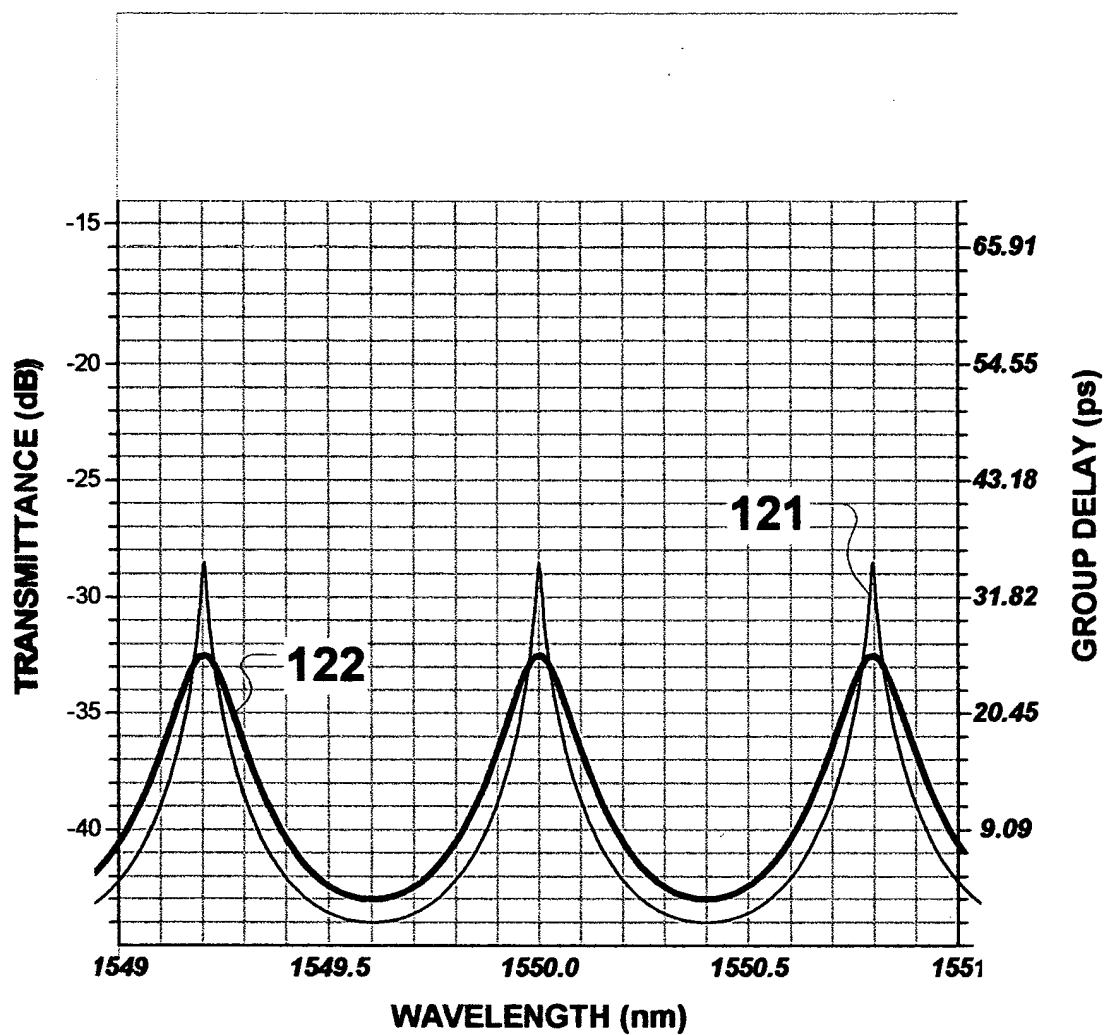


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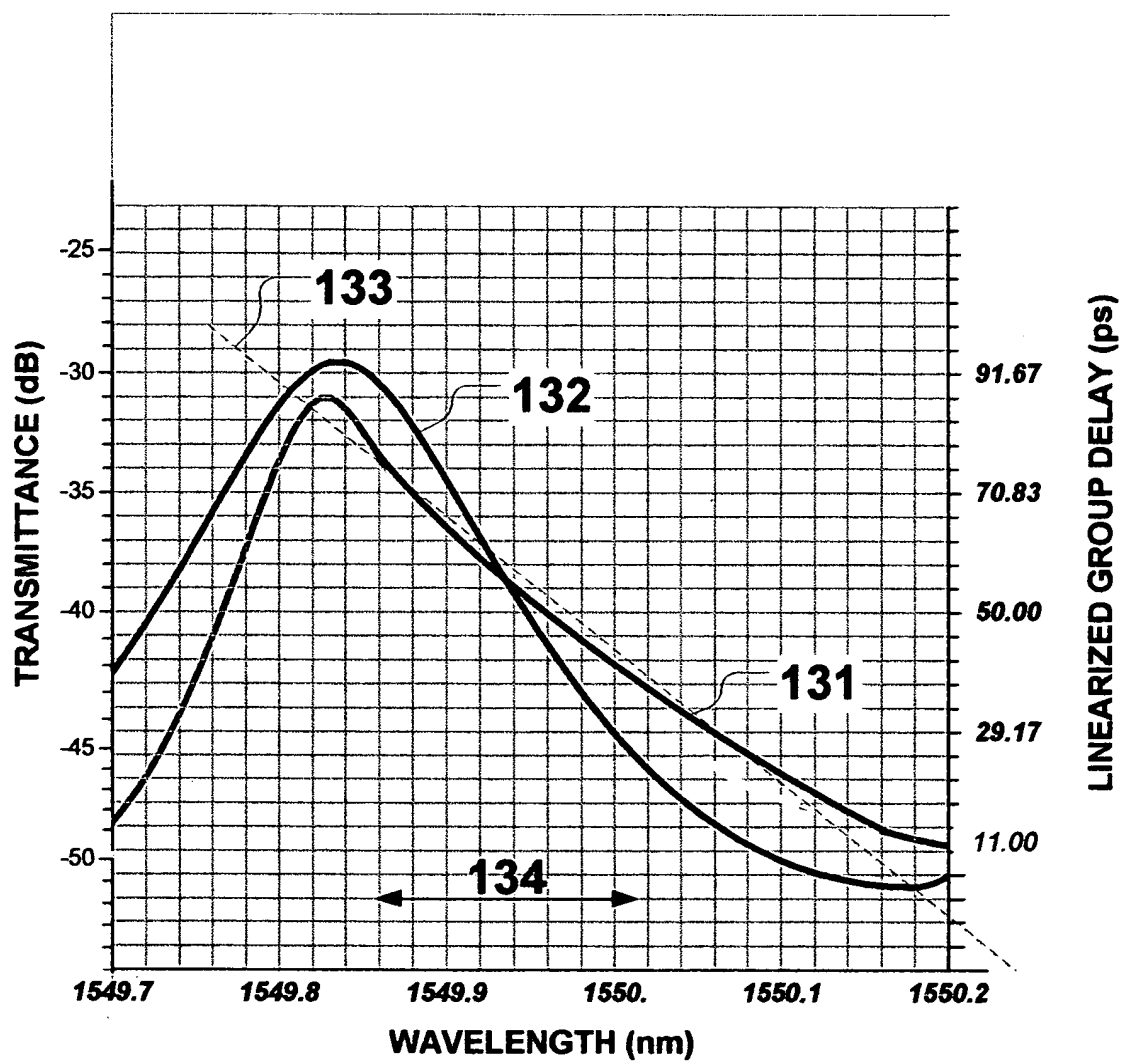


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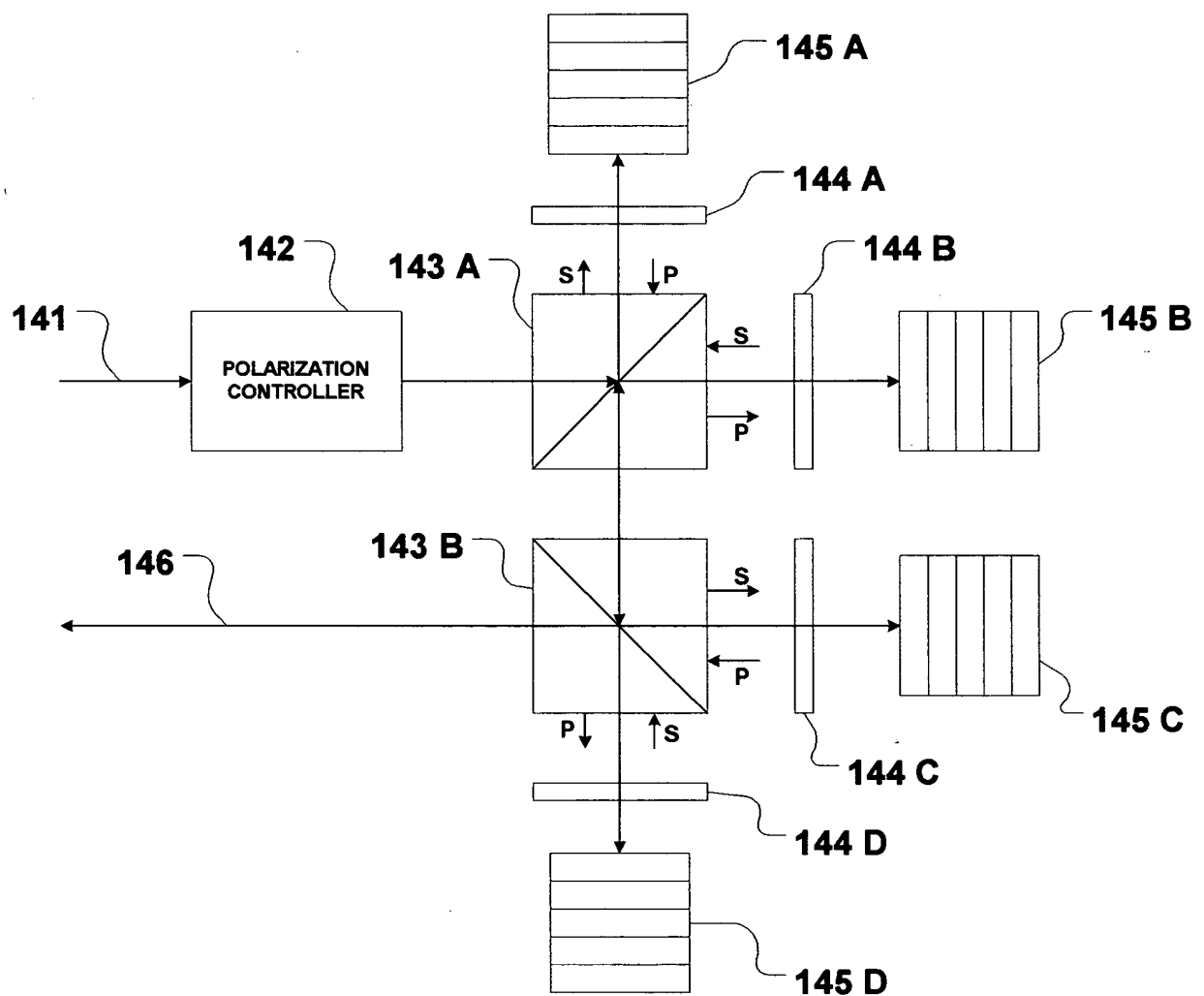


Figure 5

Figure 6a

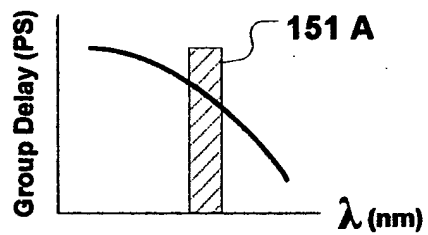


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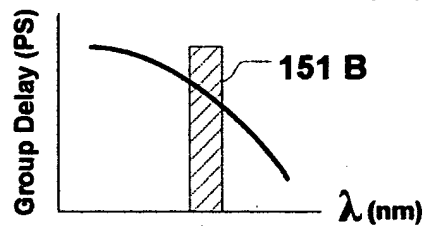


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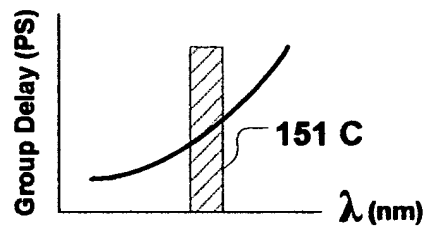


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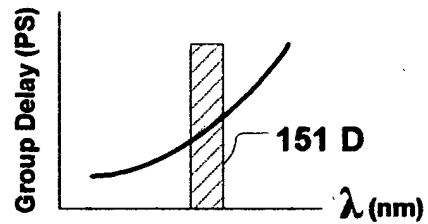


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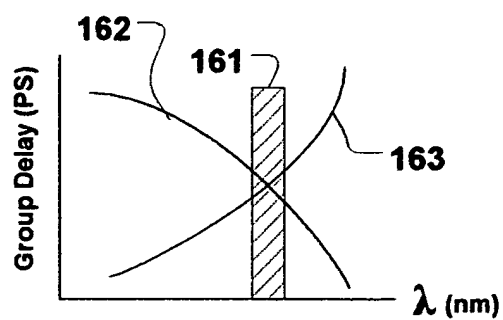


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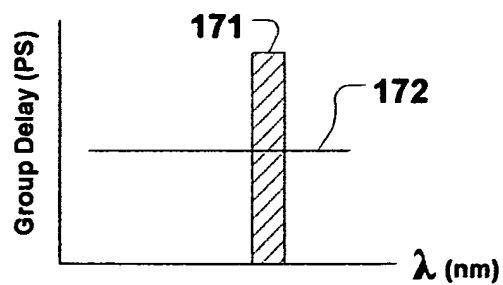


Figure 8a

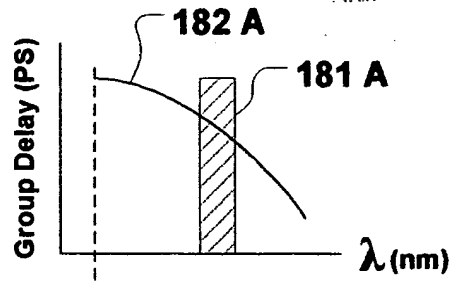


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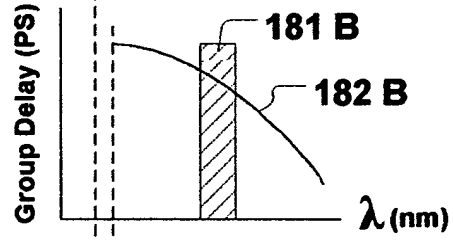


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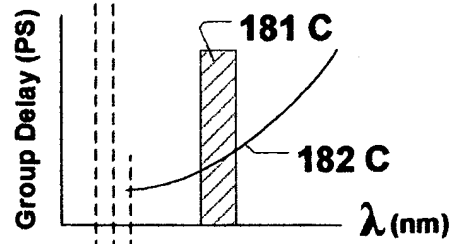


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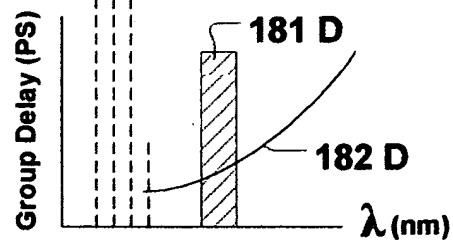


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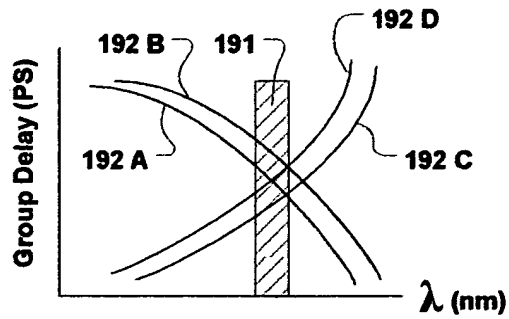
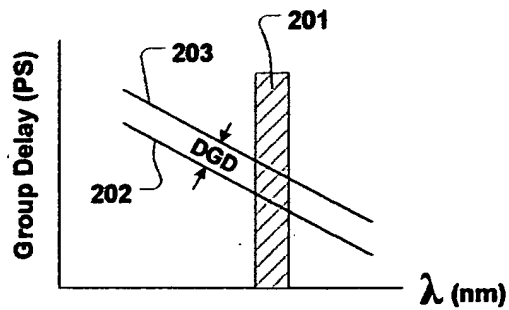


Figure 9b



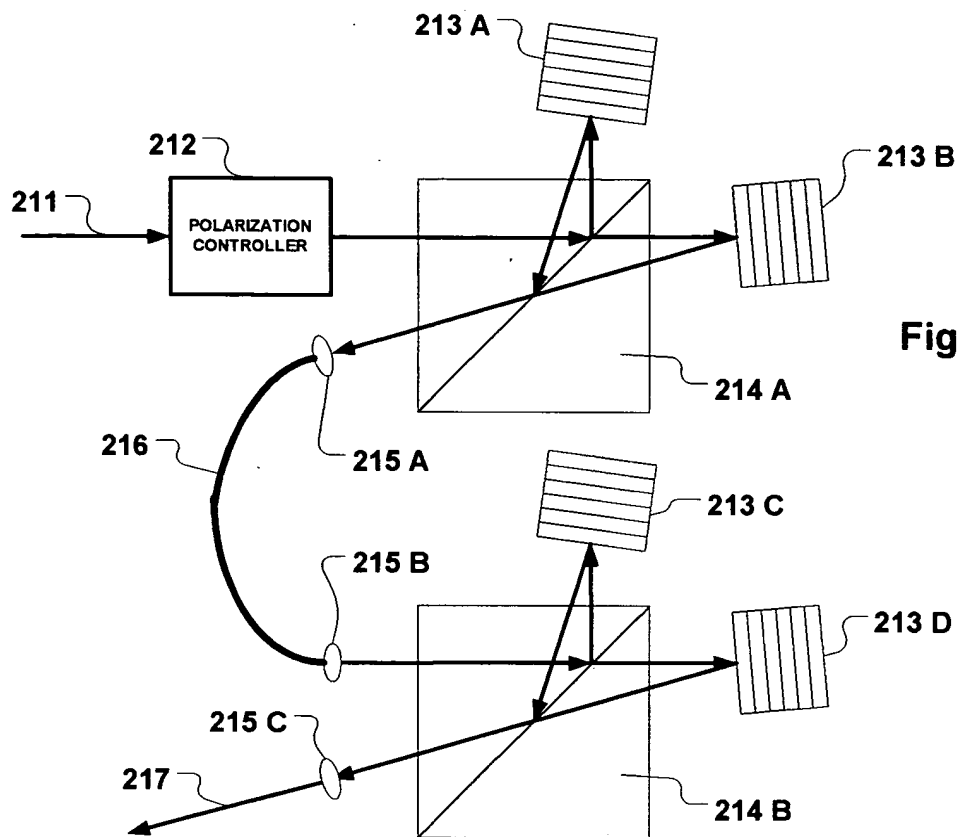


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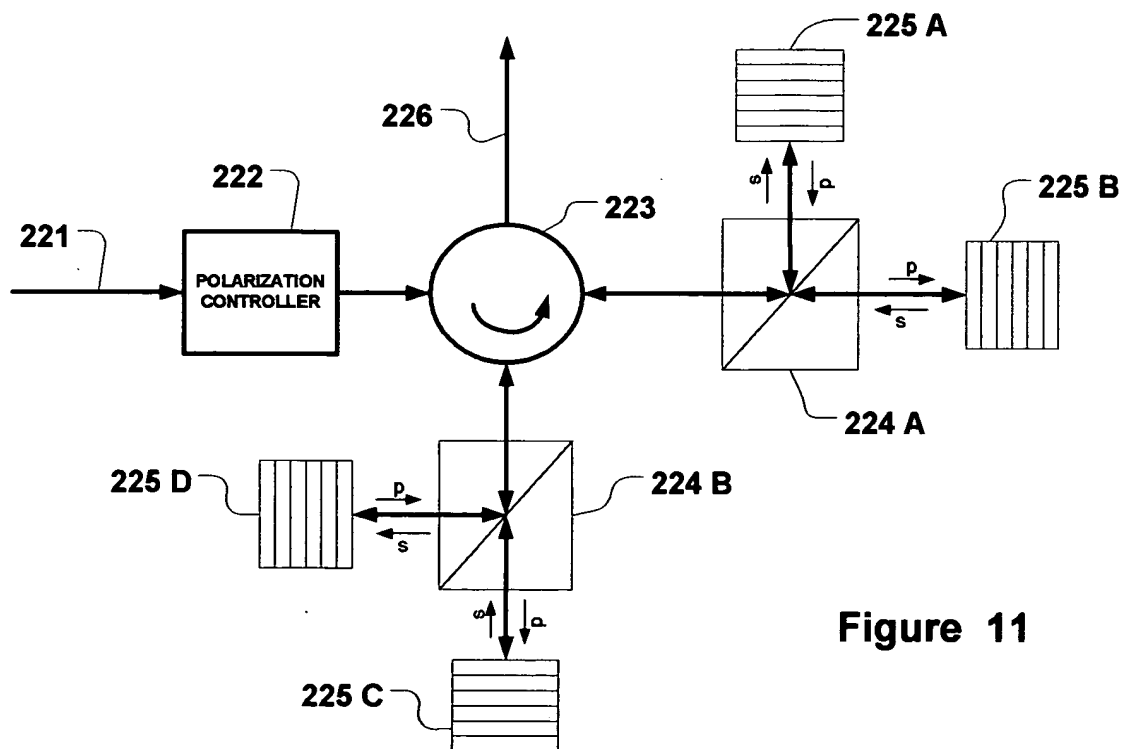


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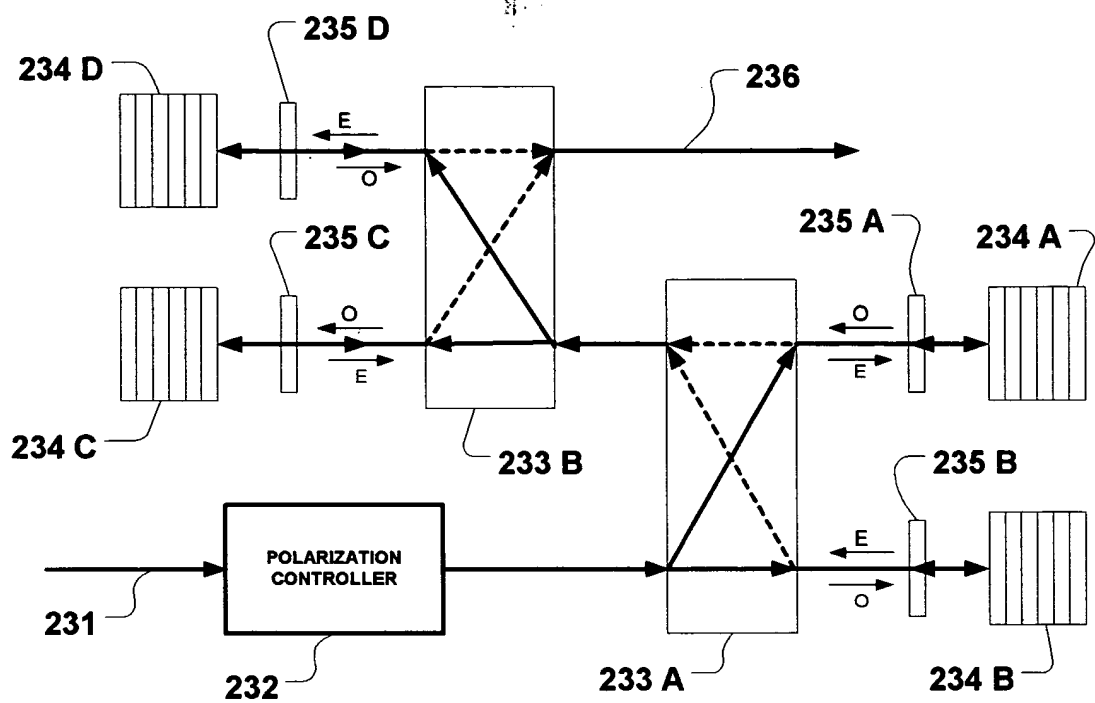


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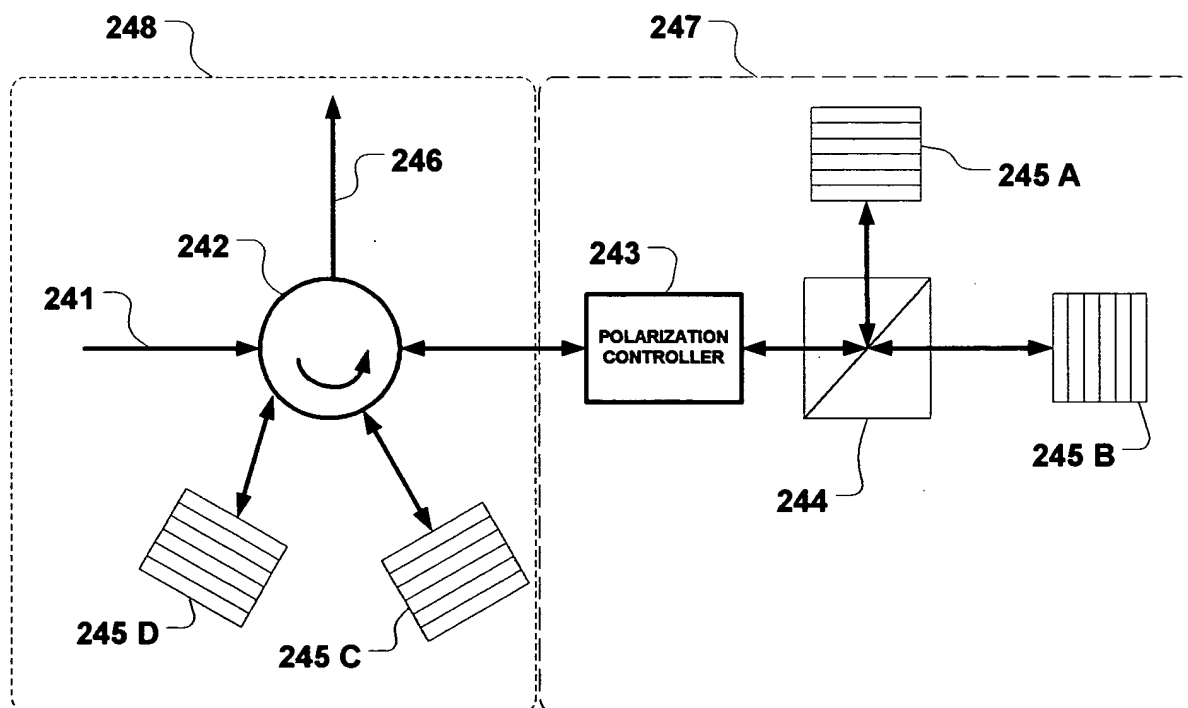


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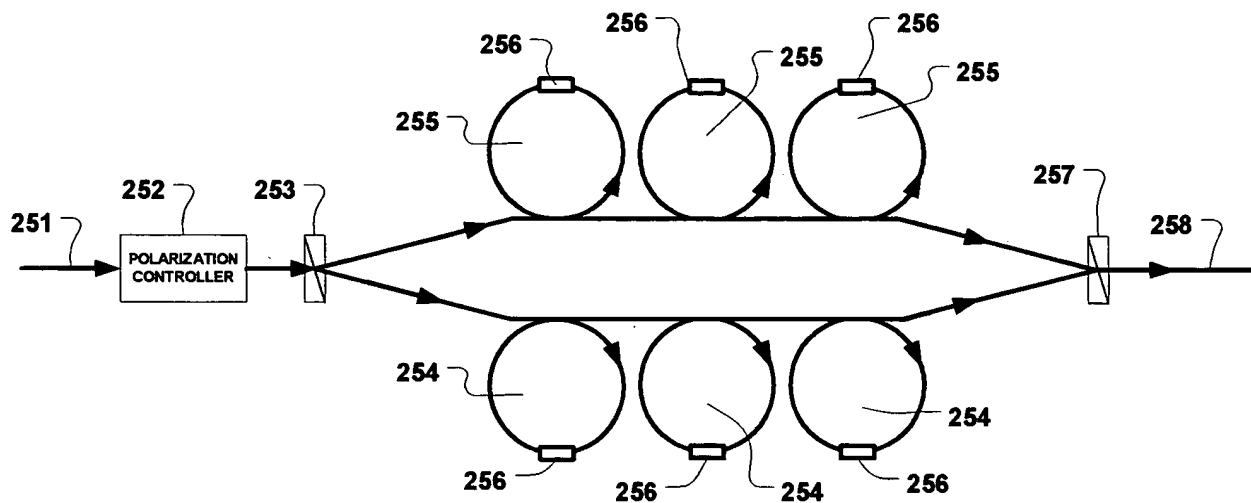


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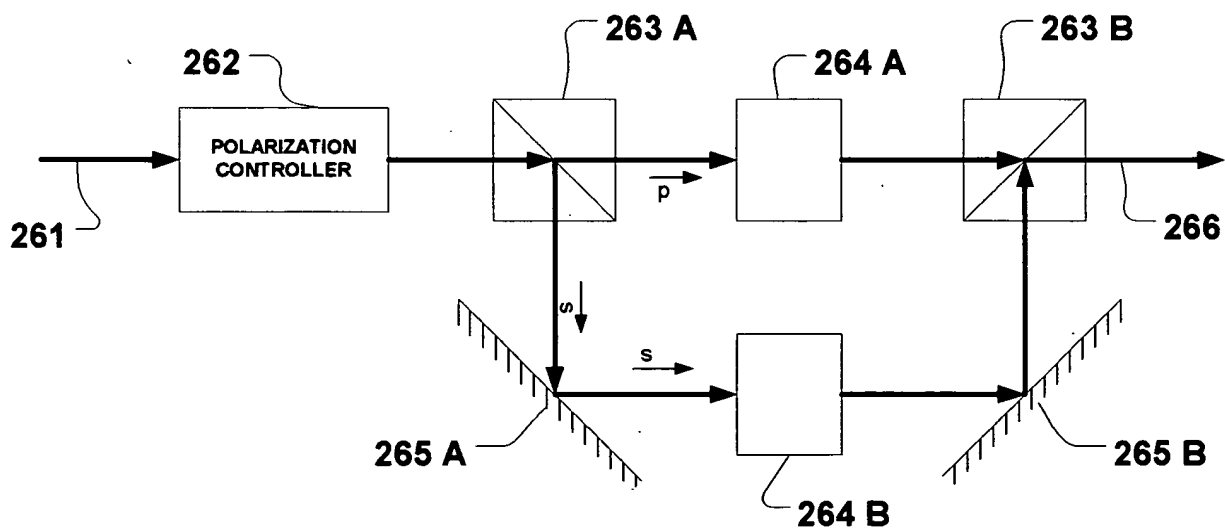


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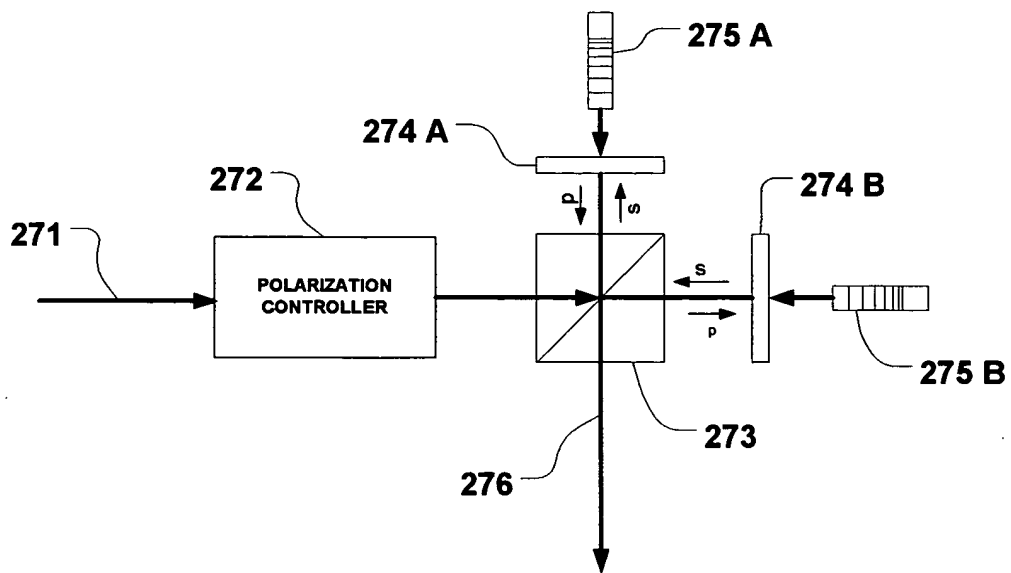


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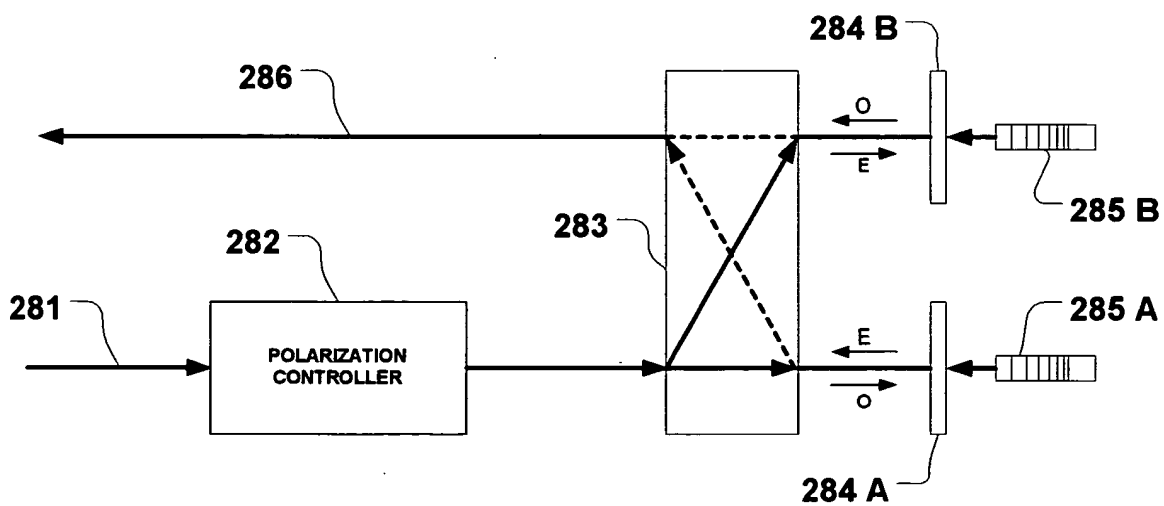


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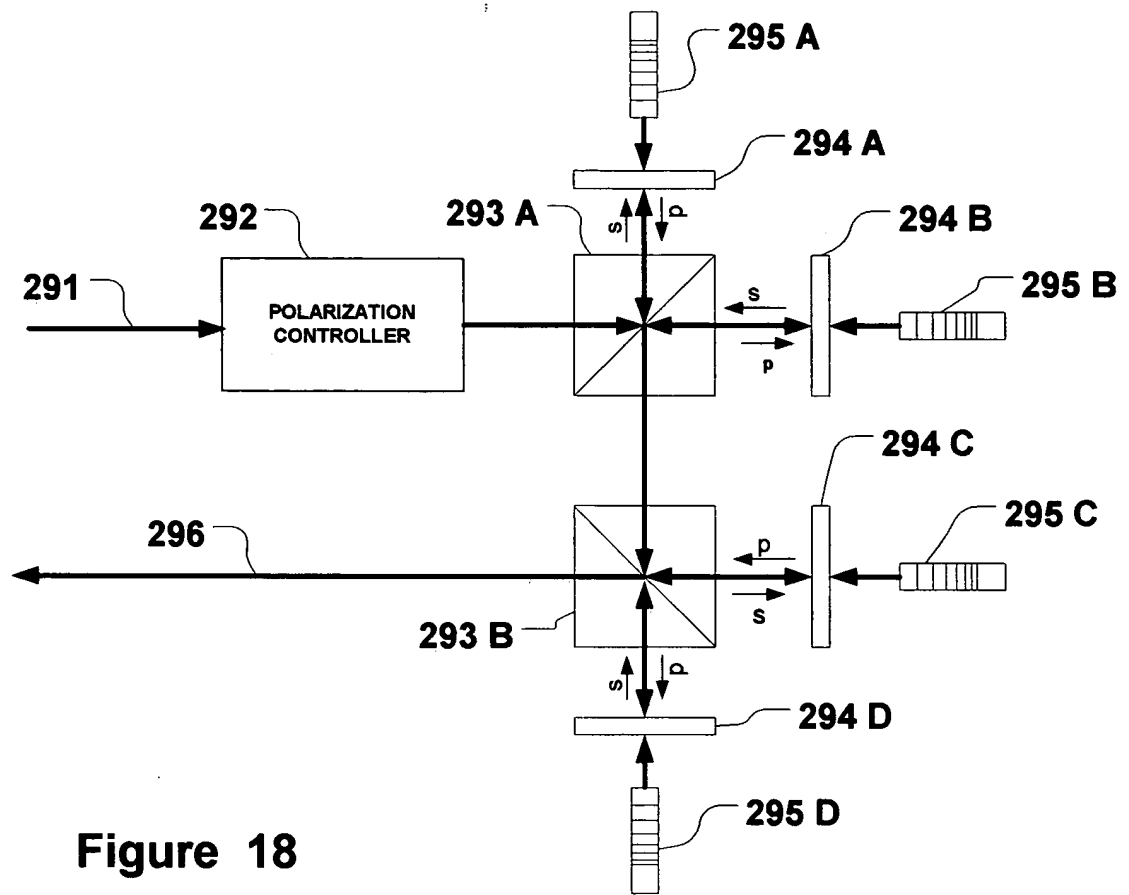


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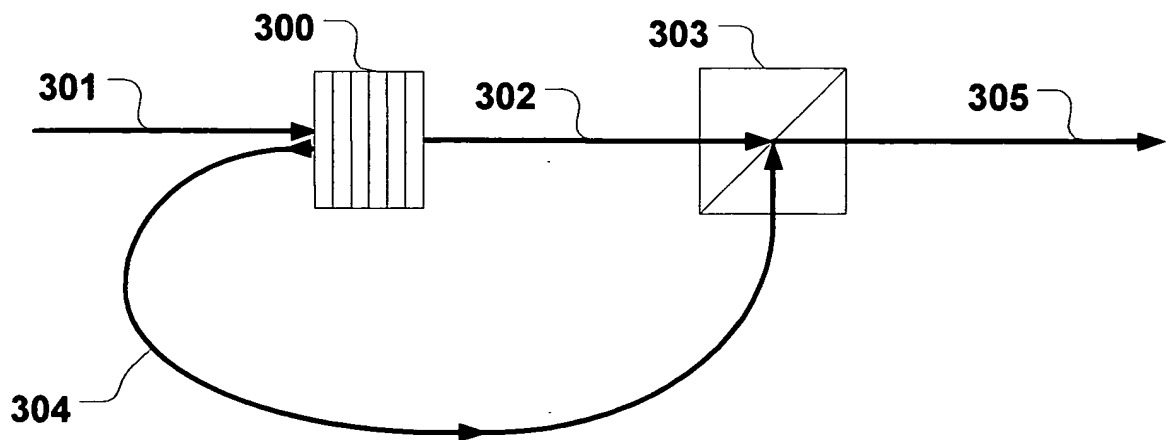


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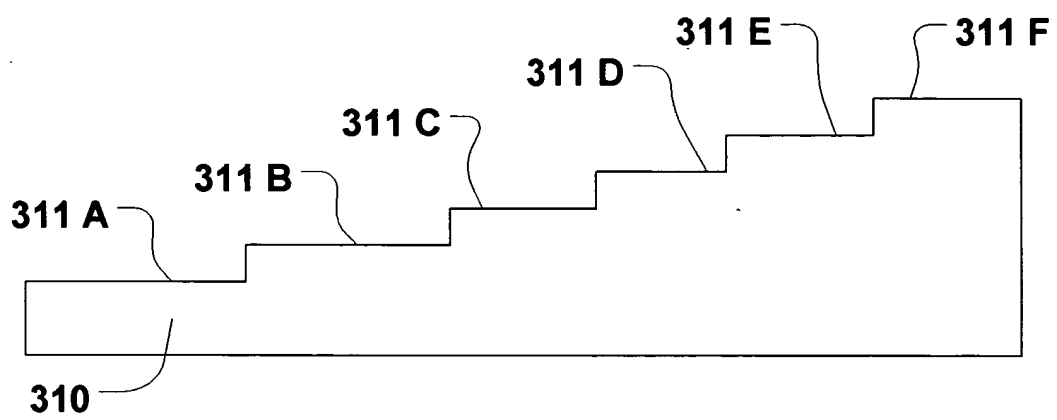


Figure 20